The European Solar Radiation Atlas and the Satellight Web Server

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In the past three years, two European projects have relied to the use of satellite images to produce solar radiation information: The European Solar Radiation Atlas and the SATELLIGHT Web Server.

The European Solar Radiation Atlas (ESRA) is based on 10 year (1981-1990) monthly mean observed data in about 340 stations and long term series of daily observed data in 89 stations. Meteosat satellite images have been used to produce maps of monthly daily means of irradiation (1981-1990) for all Europe. The ESRA which is available on a CD-ROM (PC format) offers a user friendly access to the database. It allows to produce and draw derived data (irradiation on tilted surfaces, illuminances...) and to compute the performance of simple types of solar application (solar water heater, photo-voltaic systems, passive solar heating of buildings).

The SATELLIGHT web server gives a free access to two years (1996 and 1997) of half hour daylight and solar radiation data in Western and Central Europe (from Lisbon to Moscow). The data are computed from images provided by the METEOSAT satellite, every half hour, and cover an area of about 10 km by 10 km. The web server produces information for the whole of Europe (or for 13 zones in Europe) or for a given site (selected by clicking on a map or by using a geographic name database). The user can select a period of time, one or more parameters: sunshine duration, sky type, irradiances, illuminances (on horizontal and tilted surfaces) and statistics: integrated values, mean values, cumulative frequency curves. Results will be presented in tables and graphs using the GIF and the PDF formats. They will be of use to engineering firms working in energy and lighting, to industrials developing lighting, shading or control systems, to urban planners and to the entire agricultural sector. The SATELLIGHT Internet server will be officially accessible on April 1, 1999 and open to selected beta testers in January 1999 (http://satellight.cntpc.fr).

The European Solar Radiation Atlas (ESRA)

The SATELLIGHT web server

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ESRA and SATELLIGHT

Funded by the European Union

Production of solar radiation database for end users

ESRA: Database on CD-ROM

- 10 year monthly daily means (1981-1990)
- Ground stations and interpolation with help of SRB

SATELLIGHT: Database on the Internet

- 2 years of half hour values (1996-1997)
- Entirely based on Meteosat data

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The ESRA

Three year research project: March 1995 to March 1998

Improvement of the ESRA done in the 1980s:

- Use of CD-ROM
- Solar and meteorological data from over 340 stations
- Solar radiation maps derived from the ground stations
- Algorithmic chains to derive other parameters
- Application toolbox *(PV systems, solar water heater...)*

The ESRA development team

M. Scharmer (GET consulting firm, Germany)

R. Dogniaux (Université de Louvin, Belgium)

G. Czeplak (Deutsche WetterDienst)

H. G. Beyer, L. Wald (Ecole des Mines de Paris, Sophia-Antipolis, France)

P. Littlefair (Building Research Establishment, United Kingdom)

(Voikovo Institute, Sankt Peterburg, Russia)

(INETI, Portugal)

The ESRA CD-ROM will be available this Spring

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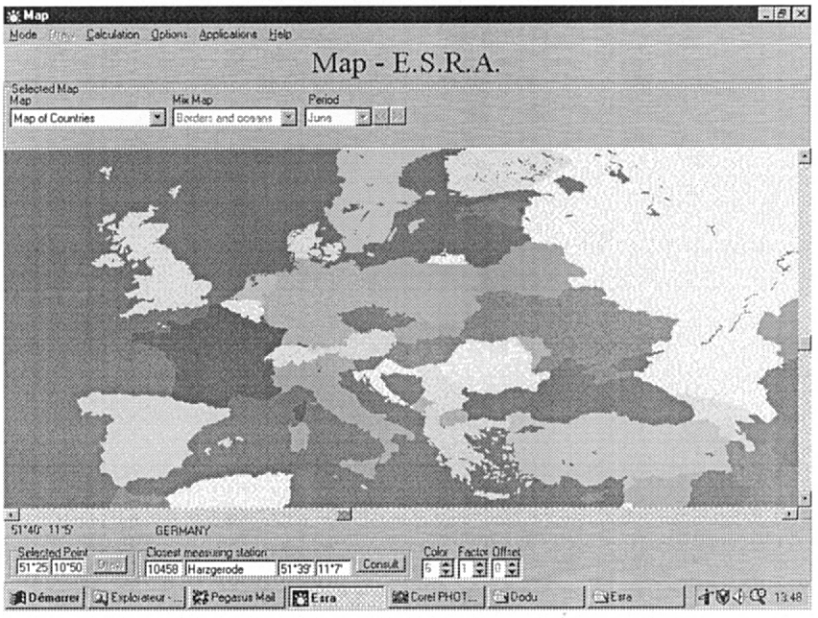
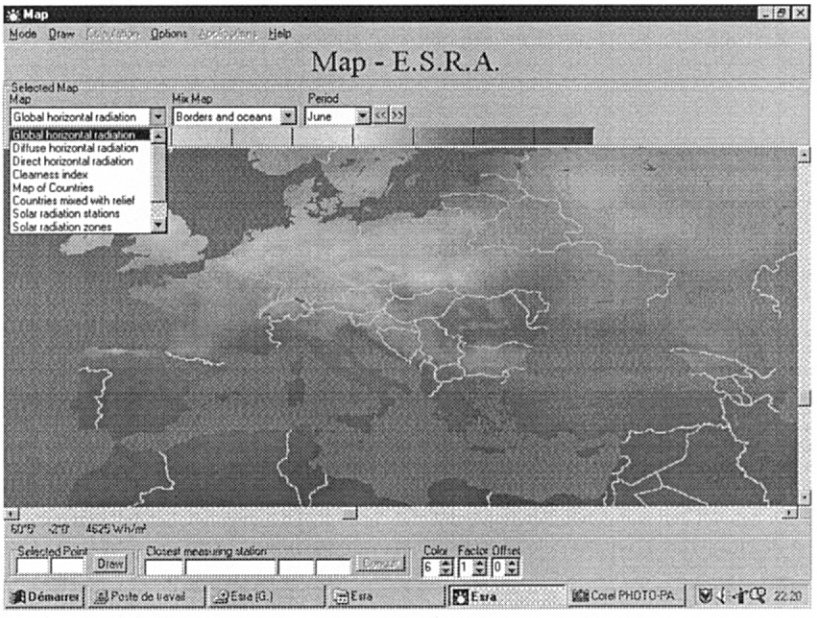
ESRA Map mode showing countries



Selection of maps



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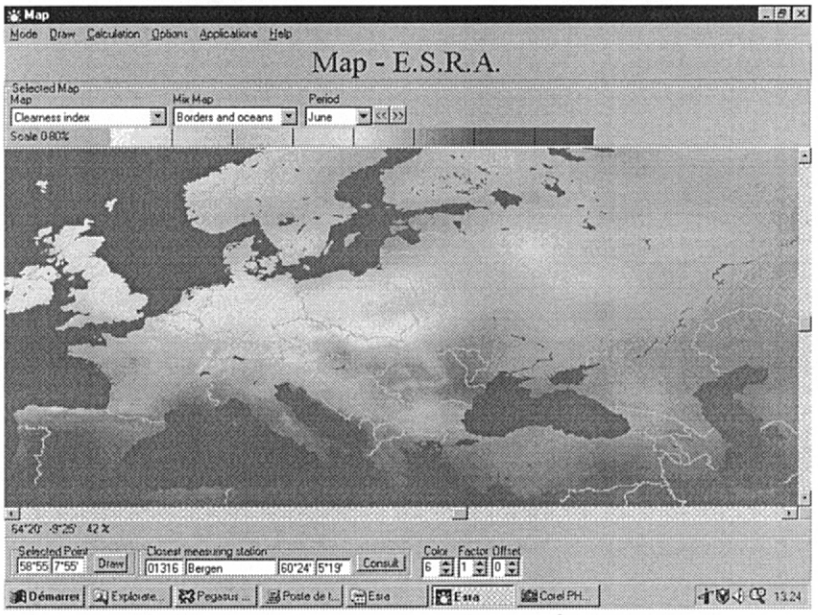
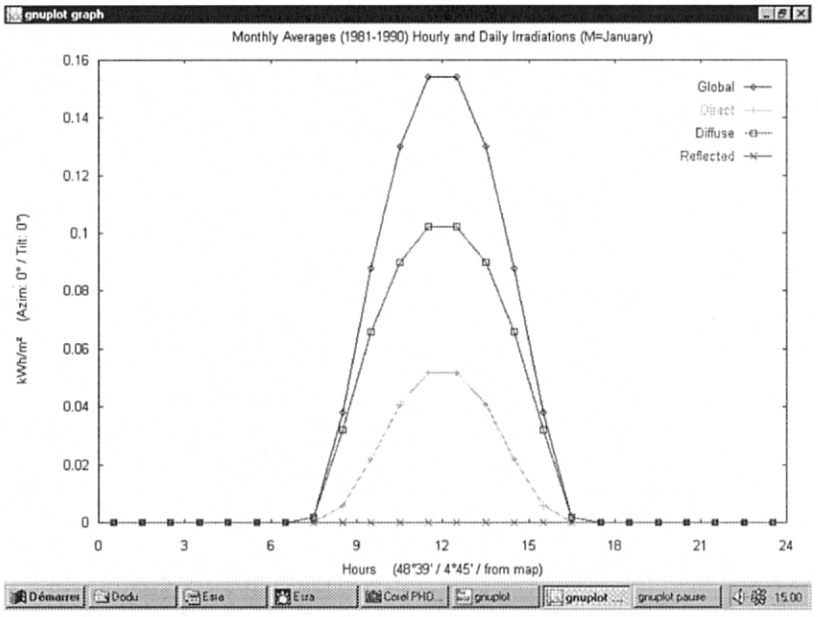
Example of clearness index map



Information can be derived directly from maps



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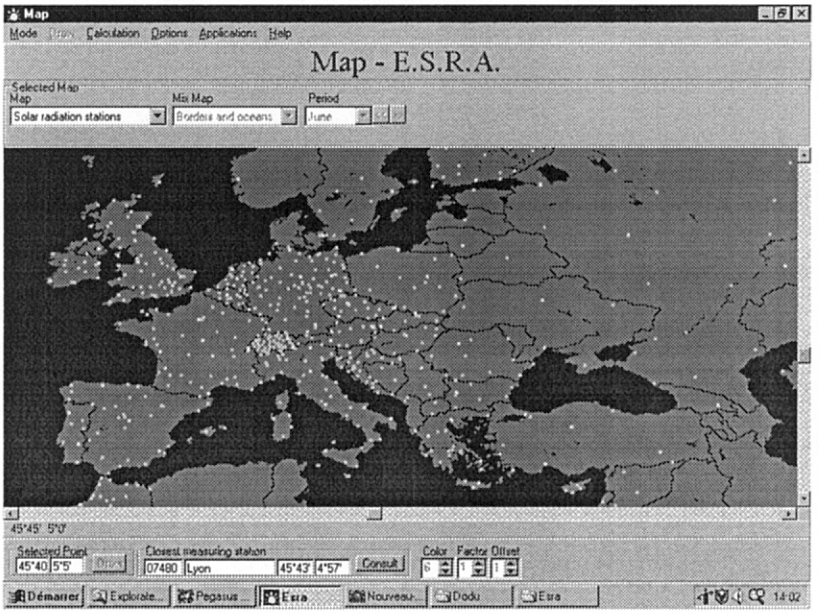
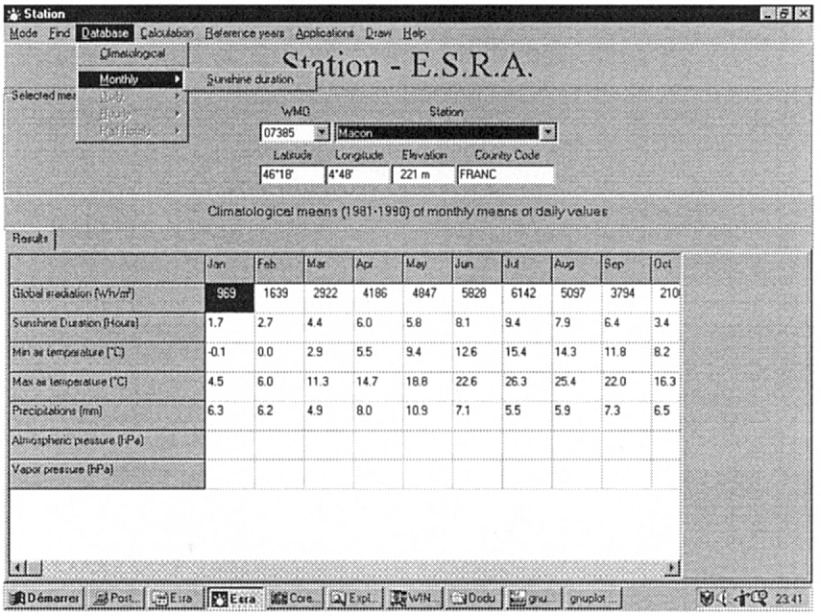
ESRA ground stations



Options of the Database menu in Station mode



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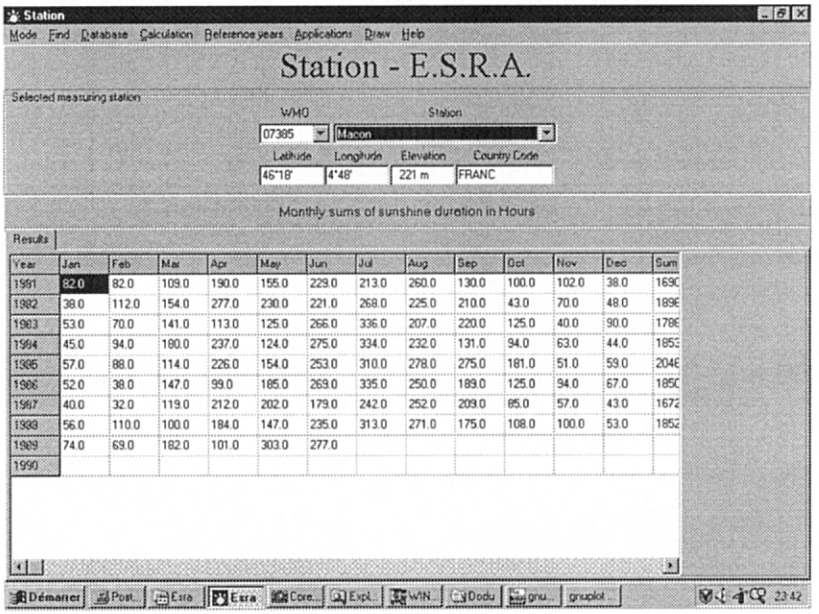
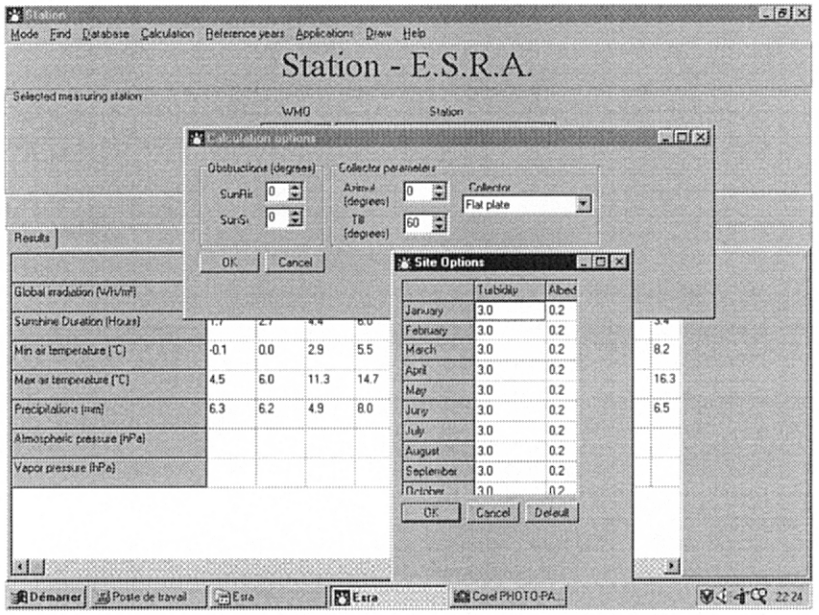
Monthly sunshine duration information



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sum
1991	82.0	82.0	109.0	190.0	155.0	229.0	213.0	260.0	130.0	100.0	102.0	38.0	1690
1992	38.0	112.0	154.0	277.0	230.0	221.0	268.0	225.0	210.0	43.0	70.0	48.0	1896
1993	53.0	70.0	141.0	113.0	125.0	266.0	336.0	207.0	220.0	125.0	40.0	90.0	1786
1994	45.0	94.0	180.0	237.0	124.0	275.0	334.0	232.0	131.0	94.0	63.0	44.0	1853
1995	57.0	88.0	114.0	226.0	154.0	253.0	310.0	278.0	275.0	181.0	51.0	59.0	2046
1996	52.0	38.0	147.0	99.0	185.0	269.0	335.0	250.0	189.0	125.0	94.0	67.0	1850
1997	40.0	32.0	119.0	212.0	202.0	179.0	242.0	252.0	209.0	85.0	57.0	43.0	1672
1998	56.0	110.0	100.0	184.0	147.0	235.0	313.0	271.0	175.0	108.0	100.0	53.0	1852
1999	74.0	69.0	182.0	101.0	303.0	277.0							
1990													

Selection of surface type and site options



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